



**UNIVERSITI PUTRA MALAYSIA**

**INTERNATIONAL CAPITAL MOBILITY AND FINANCIAL  
INTEGRATION: THE ASIA PACIFIC PERSPECTIVE**

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**INTERNATIONAL CAPITAL MOBILITY AND FINANCIAL  
INTEGRATION: THE ASIA PACIFIC PERSPECTIVE**

**By**

**CHAN TZE HAW**

**Thesis Submitted in Fulfilment of the Requirement for the Degree of Master of  
Science in the Faculty of Economics and Management  
Universiti Putra Malaysia**

**November 2001**



*To those who*  
*Read, Appreciate and, Commend*

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

**INTERNATIONAL CAPITAL MOBILITY AND FINANCIAL  
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**Chairman : Professor Dr. Ahamad Zubaidi Baharumshah**

**Faculty : Economics and Management**

This study is conducted to examine the extent of capital mobility and financial integration in the Asia Pacific region. First, the Feldstein-Horioka approach is adopted to determine the capital mobility among the US, Japan and eight Asia Pacific countries. Second, the Real Interest Parity is employed to examine the financial integration amongst these countries. To capture the effect of financial liberalisation on these countries, the sample period is divided into two sub-periods, the pre- (1971:Q1-1983:Q4) and the post-liberalisation era (1984:Q1-2000:Q3). All empirical evidences are demonstrated through the application of cointegration tests, Granger-causality, Variance Decompositions (VDCs) and Impulse Response Functions (IRFs).

The indications of non-cointegrated and inactive of causality chains of saving-investment relationships have provided sufficient evidence for the high capital mobility for all studied countries (including the United States and Japan) in both long run and short run. These findings are thus not supporting the argument which claimed that the saving-investment relationship is only applicable for small open countries. Hence, the failure of most previous researchers to establish such results may therefore

reflect the method used rather than any inherent deficiency in the saving-investment relationship. Moreover, improper treatment of non-stationarity variables may yield results that are less favourable to long run relationship between the two aggregates.

Results of real interest parity have indicated the dynamic causal linkages and greater financial integration amongst Asia Pacific countries during the post-liberalisation era. Relative active Granger-causal chains and the VDCs results have also demonstrated that ASEAN-5 are more interdependent among themselves as compared to the whole region. In addition, Singapore is found statistically endogenous in the multivariate system during post liberalisation, for both ASEAN-5 and the Asia Pacific-10 model. This would imply that Singapore has been a vulnerable (to the world market) but very competitive and efficient financial centre since 1980s. Moreover, the results of VDCs and IRFs have confirmed that the movements of real interest rates in Asia Pacific countries are mainly driven by both the US and Japan. However, the US market has much more dominance power than Japan, implying that Japan has not overtaken the role of US in the Asia Pacific regional financial market.

Increased capital mobility and high regional financial integration have always entailed with large capital inflows into the developing Asia Pacific countries. Despite the potential welfare gained, capital inflows are most likely associated with monetary and price instability, contagion effects and speculative investments. Hence, the capital-coping strategies and capital market restructuring will be the key interest for regional policy makers. Also, to provide a collective defense mechanism against systemic failure and monetary instability, this study proposes the Asia Pacific Optimal Currency Area.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**MOBILITI MODAL DAN INTEGRASI KEWANGAN ANTARABANGSA:  
PERSPEKTIF ASIA PACIFIK**

**Oleh**

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Kajian ini dijalankan untuk menentukan tahap mobiliti modal dan integrasi kewangan di rantau Asia Pasifik. Bahagian pertama kajian menggunakan kaedah Feldstein-Horioka untuk menyiasat tahap mobiliti modal antara Amerika Syarikat, Jepun and lapan negara Asia Pasifik dari segi hubungan tabungan-pelaburan. Bahagian kedua pula membekalkan bukti-bukti mengenai integrasi kewangan serantau melalui aplikasi Pariti Kadar Faedah Sebenar. Demi mengesani impak liberalisasi kewangan, tempoh kajian telah dibahagikan kepada pra-liberalisasi (1971:Q1-1983:Q4) dan selepas-liberalisasi (1984:Q1-2000:Q3). Kesemua keputusan empirikal ini ditunjukkan melalui ujian-ujian kointegrasi, penyebab-Granger, Dekomposisi Varians (DKs) dan Fungsi Tindak Balas (FTB).

Penemuan hubungan tanpa kointegrasi serta penyebab-Granger yang tidak aktif antara tabungan-pelaburan mencadangkan mobiliti modal yang tinggi wujud (baik dalam jangka panjang atau jangka pendek) bagi 10 negara yang dikaji, termasuk ASEAN-5, NIE-3, Jepun dan Amerika Syarikat. Ini jelasnya tidak menyokong kajian-kajian lepas

yang mengatakan bahawa model hubungan tabungan-pelaburan hanya sesuai untuk negara terbuka yang kecil. Dalam pada itu, kegagalan para penyelidik untuk menunjukkan peningkatan mobiliti modal sedunia adalah disebabkan penggunaan kaedah penganggaran ekonometrik yang kurang sesuai. Sifat kepegungan angkubah juga perlu diambilkira demi menjelaskan hubungan tabungan dan pelaburan.

Keputusan Pariti Kadar Faedah Sebenar pula mencadangkan bahawa pasaran-pasaran kewangan serantau Asia Pasifik adalah berintegrasi khasnya selepas liberalisasi. Daripada itu, ASEAN-5 didapati lebih berintegrasi antara mereka sendiri berbanding dengan serantau Asia Pasifik. Antara semua, Singapura didapati paling endogen, mencadangkan bahawa pasaran kewangan Singapura adalah amat cekap dari segi daya persaingan sejak 1980-an walaupun terdedah kepada pasaran dunia. Tambahan juga, penemuan melalui DKs dan FTB mengenalpasti bahawa US secara relatifnya mendominasi pasaran kewangan Asia Pasifik berbanding dengan Jepun. Maka, kajian penyelidik-penyelidik yang menyatakan bahawa peranan Jepun dalam serantau Asia Pasifik telah mendahului Amerika Syarikat adalah tidak disokong.

Penemuan mobiliti modal yang tinggi serta integrasi kewangan serantau menimbulkan prihatin terhadap impak-impak pengaliran modal antarabangsa ke negara-negara Asia Pasifik yang sedang membangun. Selain faedah yang dinikmati seperti peningkatan pelaburan dan pembangunan ekonomi, pengaliran masuk modal turut disertai kesan kontagion dan masalah kestabilan kewangan. Justeru itu, strategi-strategi pengurusan modal antarabangsa dan penstrukturan semula pasaran kewangan domestik seharusnya menjadi perhatian utama pengubal polisi. Kesemua ini membawa kepada penimbangan Matawang Optimal Serantau Asia Pasifik pada masa depan.

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I certify that an Examination Committee met on 20<sup>th</sup> November 2001 to conduct the final examination of Chan Tze Haw on his Master of Science thesis entitled "International Capital Mobility and Financial Integration: the Asia Pacific Perspective" in accordance with Universiti Pertanian Malaysia (Higher Degree) act 1980 and Universiti Pertanian Malaysia (Higher degree) Regulations 1980. The committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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## DECLARATION

I hereby declare that this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or currently submitted for any other degree at UPM or other institutions.



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## LIST OF ABBREVIATIONS/NOTATIONS/GLOSSARY OF TERMS

ADB	Asia Development Bank
ADF	Augmented Dickey-Fuller
APC	Asia Pacific Countries
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
FH	Feldstein-Horioka Approach
HK	Hong Kong
IMF	International Monetary Fund
IND	Indonesia
JJ	Johansen-Juselius
JAP	Japan
MAL	Malaysia
NIEs	Newly Industrialised Economies
PHI	Philippines
PP	Phillips-Perron
RIP	Real Interest Parity
SIN	Singapore
SK	South Korea
TH	Thailand
TW	Taiwan
US	United States of America
VECM	Vector Error Correction Modeling

## CHAPTER ONE

### INTRODUCTION

The 1980s as we remember, was a decade of rapid integration of financial markets in the industrialized world and the OECDs<sup>1</sup>. For most developing countries, financial reforms started since late 1980s and the liberalisation process is getting even more rapid in the 1990s<sup>2</sup>. In line with the increasing liberalizing of capital accounts, globalization of trade and financial deregulation has also been claimed to be the main generator of sustainable growth in most emerging markets including Hong Kong, Taiwan, South Korea and ASEAN-5 for the past two decades.

Net private capital flows to developing countries tripled from \$50 billion per year during 1987-89 to more than \$150 billion per year during 1995-1997. Also, foreign direct investment inflows to developing countries had accounted for US\$ 207.6 billion in 1999 (see Table 1.4). Meanwhile, the ratio of private capital flows to domestic investment in developing countries increased to 20% in 1996 from only 3% in 1990. Despite the economic liberalization, rapid growth of international capital flows is also driven by revolutionary changes in information and communication technologies, which have transformed the financial services industry worldwide. Computer links enable investors to access information on asset prices at minimal cost on a real-time basis, while increased computing power enables them to rapidly

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<sup>1</sup> See Lemmen and Eijffinger (1993, 1995) for a comprehensive survey on European Community and OECDs while Frankel (1993) on 25 both developed and developing countries.

<sup>2</sup> Applying Uncovered Interest Parity, Hong (2000) found increased capital mobility for 7 Asian countries. In addition, Phylaktis (1999) found extensive real interest rate linkages among 5 developing Asia Pacific countries with world financial markets, implying a high degree of financial integration in the region.

calculate on correlations among asset prices and between asset prices and other variables. Thus, it is becoming more difficult for government to governance international capital flows.

Conventional wisdoms tell us that financial liberalization and integration have contributed to higher investment, faster growth, and more efficient allocation of resources as well as better living standards. Several economic thoughts in the 1990s suggest that capital inflows may lead to harmful outcomes if distorted by incomplete information, which further lead to problems of adverse selection, moral hazard and herding behaviour. At least, such asymmetries can lead to inefficiencies; in extreme, they may lead to costly financial crisis such as the current Asia financial crisis (see Eichengreen *et al.*, 1999).

The Asian currency crisis erupted with the devaluation of the Thai baht in July 1997. In the 18 months that have followed, the contagion effects of currency crisis have spread throughout Asia Pacific and triggered financial crisis. Both Japan and the US, who are very close to the Asian economies, are also affected by the crisis. In Indonesia, it has even escalated into political and social crisis. From its vaunted status as 'the world's growth center', Asia has suddenly been transformed into the epicenter of a global economic meltdown<sup>1</sup> (see Table 1.1).

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<sup>1</sup> During 1998, due to the impact of the financial crisis, the Asian economies deteriorated with each successive quarter. Its effects included declines in domestic demand factors, such as consumption and investment, as well as stagnating exports. The situation became increasingly serious during 1999 where some Asian economies experienced substantial negative growth, as reported by the Center for Pacific Business Studies (2000).

The Asian financial crisis has brought growing concern on the reforms of international financial system. Some crisis countries have blamed the international financial system that allows for speculation activities, has to great extent, contributed to the external vulnerability and financial crises. At the recent APEC (Asia Pacific Economic Cooperation) meetings, leaders have called for the creation of disclosure standards for short-term speculative funds, such as the hedge funds. They welcome any proposals that could protect emerging countries from the effects of sudden movements of short-term funds and currency attacks. Of all, economic regeneration and regional cooperation towards currency and financial stability will be emphasized. These Asia pacific countries are expected to adopt policies that would provide a collective mechanism against systemic failures and monetary instability, including a closer regional monetary cooperation and arrangements.

Nevertheless, high regional financial integration and high capital mobility across each other are essential for countries that wish to establish closer regional cooperation and other regional monetary arrangements, such as the trade bloc or regional currency arrangement. These issues have thus motivated us to conduct this study on the extent of capital mobility and financial integration within the Pacific Rim. Although there have been studies on the regarding topic, most studies were based on the experiences of the developed countries such as the OECDs and the European community. This study is conducted to fill the research gap by giving special focus on the developing Asia-Pacific basin countries, including the ASEAN-5 and three newly industrialized economies (NIEs) namely Taiwan, South Korea and Hong Kong. In addition, we also include the US and Japan to evaluate the relative influence of world economy on the Asia Pacific regional financial markets.

## Capital Mobility

Flows of capital between one country and others, include debt, portfolio equity and direct/ real estate investment are recorded in the capital account of its balance of payments. Capital outflows include residents' purchases of foreign assets and repayment of foreign loans, whereas inflows include foreigners' investments in home-country financial markets and property and loans to home-country residents. Free transaction of capital flows without restrictions among countries are thus named as capital account liberalization or sometime known as capital mobility. Capital mobility allows countries with limited savings to attract external sources for financing productive domestic investments. It also stimulates business cycles by allowing households and firms to continue buying and investing when domestic market fails to produce sufficient resources. By contrast, with lending money abroad, households and firms can reduce their vulnerability to domestic economic disturbances. Companies can thus protect themselves against sudden cost increases in home country, for instance by investing in foreign countries. In other word, this enables investors to achieve higher risk-adjusted rates of return. In turn, higher rates of return encourage saving and investment that generate faster economic growth.

Free flows of international capital do not guarantee benefits. If a financial market is distorted by asymmetric information gap, that is one party of the financial transaction (lenders) has less information than other party (borrower), then an inefficient and unstable financial market would be expected. Three inefficient

outcomes particular, which are moral hazard<sup>4</sup>, adverse selection and herding behavior, have always been associated with asymmetric information. At least, such asymmetries can lead to inefficiencies; in extreme, they will lead to costly financial crises.

Moral hazard has been the major concern in developing countries by many critiques. This happens when investors are expecting governments to bail them out during financial crisis. This problem is usually caused by government guarantees for financial institutions in the absence of adequate safeguards or sufficient incentives for market discipline to police excessive risk-taking behaviour. With asymmetric information, a creditor may not be able to observe if a borrower will invest in a highly risk or risk-free project. In addition, if that borrower is protected by limited liability or guarantees, too many risky investments are to be expected since high returns are associated with high risk. For instance, companies or banks with negative worth borrow to gamble for redemption that is, invest in ventures with a high potential payoff (and thus potential rescue from bankruptcy) but a low probability of success. Over time, lenders will become more reluctant to make loans and the capitals being invested will be less than the amount that make sense from an economic perspective.

Adverse selection occurs when lenders are willing to pay (lend money) a price for a security that reflects only the average quality of firms (borrower) issuing securities, knowing that they cannot fully evaluate the creditworthiness of each borrower due to asymmetric information. These of course are unfair to high quality

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<sup>4</sup> The role of moral hazard in the onset of the Asian crisis 1997/98 has been stressed by a number of authors, namely Krugman (1998), Greenspan (1998), Fisher (1998) and, Sarno and Taylor (1999). According to them, before the Asian financial crisis, Asia leading national banks were excessively borrowing from abroad and lending excessively at home. These capitals have flowed to lots of risky and dubious profitable projects, which later put the investors/ bankers into large debts and even bankruptcy when currency crisis occurred.

firms while low quality firms are benefited. Realizing that securities are undervalued (or, excessive borrowing cost) for high quality firm, fewer securities will be issued and many profitable projects will not be undertaken. By contrast, the less successful or even loss-making projects of low-quality firms will be financed.

Herding behavior on the other hand occurs when lenders try to follow the lead of someone they believe to be better informed. In addition if investors are not alert of the quality of their fund manager, herding behavior may also happens. Low quality fund managers will find it rational to emulate the investment decisions of other managers. Thus herding makes sense when the payoff to an agent adopting an action increases because many other agents adopt the same action. For instance, individual currency traders may be too small to exhaust a central bank's reserves and force currency devaluation, but simultaneous sales by several big traders can bring about such pressure, thus rewarding the first agent's decision to sell the currency. Hence herding behavior of large amount of investors can amplify price movements and precipitate sudden crises.

### **Financial Integration**

Perhaps the simplest approach to analyze the degree of market integration is the computing of the correlation between returns on those markets that are thought to be integrated. This approach is based on rather simple intuition: the more integrated markets are, the higher the co-movement between their prices. However, it is now well known that higher correlation is neither a necessary nor sufficient condition for greater market integration. If markets are completely integrated and, therefore, there

are no arbitrage opportunities, returns on different assets can be divided into a common component and an idiosyncratic one.

In addition, perfect cross-market integration is generally understood as a situation in which there is no barrier of any kind to cross-border financial transactions, such as tariffs, taxes, restrictions on the trading of foreign assets, information costs or any other cost that makes it more difficult to trade across countries than within them. With perfect cross-market integration there are no cross-market arbitrage opportunities and the law of one price (LOP) holds, i.e. portfolios with the same payoffs should have the same price in different markets. It is worth noting, however, that, as suggested above, the LOP or the absence of arbitrage opportunities cannot be assessed from the analysis of the co-movement of the levels of financial asset prices or of their volatilities.

As pointed out by Shepherd (1994), financial integration can be explained in terms of asset price, capital stock and flow adjustments. Arguably, the most theoretically satisfactory definition of financial integration is based on asset substitutability, on the LOP, whereby equal and free access to information equalizes returns on perfectly substitutable assets. Such asset substitution is dependent on the willingness of asset-holders to exchange financial claims, but the presence of any barriers to trade in financial assets whether they are institutional, subjective or expectational, will ensure imperfect asset substitution.



## **Measurements of Capital Mobility and Financial Integration**

In general, there are three main criterions/approaches to measure international capital mobility and financial integration. First is the Interest Rate Parity (price approach), which include Covered Interest Parity (CIP), Uncovered Interest Parity (UIP) and Real Interest Parity (RIP). Second is the well known but controversial Feldstein-Horioka approach (quantity approach) and the third one is the Consumption Smoothing Approach.

### **Covered Interest Parity (CIP)**

Covered Interest Parity (CIP) requires capital flows equalized interest rates across countries when contracted in a common currency (see Frankel, 1992). In other words, CIP holds if forward premium/ discount equal the nominal interest differential at appropriate maturity. Lemmen and Eijffinger (1993, 1995) pointed out that CIP shows the ability of financial capital movements. In addition, the country premium captures the impact of actual and future capital controls, default risk and transaction cost. According to Moosa (1996), CIP only measure capital mobility in a narrow sense as it concerns with short-term capital movement. CIP thus is unlikely to hold in long-term capital due to the unavailability of long-term forward contracts.

### **Uncovered Interest Parity (UIP)**

Uncovered Interest Parity (UIP) on the other hand requires capital flows equalized expected rates of returns on countries' bonds, regardless of exposure to exchange risk. UIP holds when expected nominal exchange rate change equalized the nominal interest differential at appropriate maturity. UIP takes the CIP assumption of